

+ XVII.—*A Review of the Species of the Genus Scolopax.*
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THE Snipes are a very interesting group of birds, not only to the sportsman, but also to the ornithologist. Few birds give better sport in the field, and few genera are capable of being made a better text from which to preach an ornithological sermon on the new point of view from which the subject must be regarded, now that the theory of the evolution of species is generally accepted.

The Snipes belong to the family Charadriidæ, which also includes the Sandpipers, Curlews, Plovers, and a few other allied genera. From all these birds they are very easily and very distinctly characterized. Most of the Charadriidæ are partially web-footed; they have a distinct web at the base of the toes, sometimes much more developed between the outer and middle toe; but the Snipes, some of the Sandpipers, and the Turnstones are exceptions to this rule, having no rudimentary web between any of the toes, which are all cleft to the base. Again, most of the Charadriidæ have comparatively long legs and short bills; the Snipes, on the contrary, have short legs and long bills. The only birds in this family (except the Snipe) in which the bill is as long or longer than twice the length of the tarsus are the females of one or two species of Curlew, and one or two species of Sandpiper, none of which have all the toes cleft to the base. The genus *Scolopax* may therefore be diagnosed as follows:—

Charadriidæ having the bill twice as long as the tarsus, and all the toes cleft to the base.

The Snipes are the only birds in the family which combine both characters; the diagnosis is therefore perfect, including all the species which belong to the genus *Scolopax*, and excluding every other bird.

The genus *Scolopax* may, however, be diagnosed almost more simply as:—Charadriidæ having the tarsus shorter than the middle toe and claw, and with parti-coloured tail-feathers.

It is quite possible to construct other diagnoses of this

genus which, if more complicated, are nevertheless founded upon characters of equal importance; but enough has been said to show what a good genus *Scolopax* is. To split up such a sharply defined well-characterized genus into four or five ill-defined badly-characterized genera is surely both unnecessary and unwise. Like every other genus it may easily be divided into subgeneric groups, because the gaps between the species are not of exactly the same width. A coincidence so remarkable seldom or never occurs.

Most ornithologists recognize the two groups of Snipe and Woodcock as generically distinct, but they probably do so because they are unacquainted with the intermediate forms which connect them. The three species of European Snipe have many characters in common which distinguish them from the Woodcock.

1st. In the Snipes the tibia is bare of feathers for a considerable distance, whilst in the Woodcocks it is feathered to the joint. This diagnosis would make the species of Woodcocks to be eleven in number.

2nd. In the Snipe the number of tail-feathers is usually fourteen or more, whilst the Woodcock has only twelve. If the species were divided upon this character, the Jack Snipe must be added to the Woodcocks, and six of the other eleven Woodcocks must be removed to the Snipes.

So much for what are called structural characters; but by bringing characters founded upon colour to the rescue, we find other differences, as we shall see in the sequel, of obviously greater generic value.

3rd. The bold black markings on the heads of the Snipes begin at the base of the bill and are longitudinal, whereas in the Woodcocks they are confined to the hind head and are transverse. This character excludes the Jack Snipe once more from the Woodcocks, and confirms the removal of the six species excluded by the second character, thus reducing the Woodcocks to five species.

4th. The tail-feathers of the Woodcock have curious silvery white tips, of which no trace is to be found in the

Snipe. This character confirms the five species mentioned in the last paragraph as the only true Woodcocks.

5th. The primaries of the Snipe are uniform in colour, whilst those of the Woodcock are barred. This character excludes three out of the five Woodcocks, but admits two other species, neither of which possesses any of the four previous characters, so that it may be dismissed.

6th. The eggs of the three species of European Snipes, and those of several species of African and American Snipes, closely resemble each other, and differ widely from those of the European and American species of Woodcocks. The eggs of several species of both groups are unknown, but the eggs of one at least of the two Snipes which the fifth character would determine to be Woodcocks exactly resemble, except in size, the eggs of the latter group.

Other minor points might be mentioned, but enough has been pointed out to show that Nature has drawn many lines between the Snipes and the Woodcocks, but unfortunately she has not drawn them in the same place. Two conclusions may be arrived at from the foregoing facts. One of these is that the characters of the Woodcocks and the Snipes are so closely interlaced that no ornithologist attempting classification on scientific principles would be likely to advise the subdivision of such a natural group as the genus *Scolopax*. The other conclusion requires consideration at greater length.

Some ornithologists not only separate the Woodcocks generically from the Snipes, but further subdivide each of these groups. These writers have adopted a theory that what they call structural characters are of generic value, whilst they regard differences of colour as only of specific value. In accordance with this notion, they have placed the American Woodcock and the Jack Snipe in distinct genera, because in the former some of the primaries are remarkably attenuated, and in the latter the bill and the sternum are slightly exceptional, regardless of the facts that the American Woodcock is apparently more nearly related to the European Woodcock than either of them are to the Moluccan Woodcock, and that the Jack Snipe and the

Common Snipe are obviously nearer related to each other than either of them are to the Imperial Snipe of Colombia. All generic distinctions must be genetic distinctions, otherwise they are of no value. The theory that structural characters only are of generic value, is either based upon the presumption that they date further back than characters founded upon difference in colour and pattern of colour, or it is an antiquated, unscientific, and absurd hypothesis.

The Snipes and their nearest allies furnish some remarkable instances in which it is impossible to believe that differences of structure date as far back as differences of colour. The Painted Snipes (*Rhynchæa*)* of South Africa, India, China, and Australia are precisely alike in colour. It is not known that the males from any of these localities can be distinguished from each other in any way. Gould's supposition that the Painted Snipe from Australia has a shorter foot than the others appears to be unfounded, now that a large series of each have been examined. Nevertheless there seems to be unimpeachable evidence that the females of the Australian birds differ from those of Africa, India, and China in having the trachea elongated and convoluted in a remarkable manner, somewhat similar to that to be found in certain Cranes, Swans, and Geese. These birds may or may not be regarded as generically distinct from their respective allies; but be that as it may, no one can imagine that the common ancestors of the African and Australian Painted Snipes differed in colour from their two groups of descendants, and that consequently the two latter have independently developed a perfectly similar series of colours complicated in character, and differing to an unusual degree with age and sex. During the period which must have elapsed before the convolutions of the trachea could either have been lost in the African birds, produced in the Australian birds, or modified by each of them in opposite directions from an intermediate ancestral

* The position which Sundevall has assigned to this genus—between *Ibidorhyncha* (which is a slightly modified Oystercatcher) and *Numenius*—is one of many similar cases which amply justify Professor Newton's unfavourable criticism of that over-estimated systematist.

form, it seems as if the colour, with all its complications of pattern and variations with age and sex, must have remained unchanged. The Jack Snipe is another case in point. Notwithstanding the fact that its bill has become considerably modified from the typical Scolopacine form, and that, unlike any other Snipe, it has two instead of only one notch on each side of the posterior margin of the sternum, it has retained the longitudinal markings on the head which proclaim it a Snipe and not a Woodcock, as well as the peculiar colour and pattern of the dorsal plumage which are common to most species of both groups, whilst in the coloration of the tail it differs far more from the Snipes than they do from the Woodcocks.

In dividing the Snipes from the Woodcocks there cannot be much doubt that the natural line is that laid down by our third character and confirmed by the fourth, both characters being founded on differences of pattern of colour. It can scarcely be denied that in the Snipes, at all events, differences in the pattern of colour are of older genetic date, and therefore of higher generic value than so-called structural differences; and that those ornithologists who maintain the contrary are advocating a hypothesis inconsistent with the theory of the evolution of species.

The geographical distribution of the Snipes is most remarkable, few genera of birds being so nearly cosmopolitan as the genus *Scolopax*. In the Arctic Regions both of the Old and of the New World Snipes breed beyond the Arctic Circle: in Norway, under the influence of the Gulf-stream, as far as 70° N. lat. No true Snipe is known to breed in Australia (the eggs attributed to the Australian Snipe are undoubtedly those of the Australian Painted Snipe); nor is any Snipe known to breed in any of the South Pacific islands, with the exception of the Auckland and Chatham Islands, south of New Zealand. No true Snipe breeds in the Oriental Region, except at great elevations in the Himalayas; but, after the breeding-season, India, the Malay Peninsula, and Australia are visited by enormous numbers of these birds. Otherwise the Snipes are cosmopolitan, breeding in Europe, Asia, Africa, and in both North and South America.

† 1. *SCOLOPAX RUSTICULA*.

Our Woodcock is a semi-arctic bird ranging from the Atlantic to the Pacific. In Scandinavia it breeds up to lat. 67°, in West Russia to 65°, but in East Russia and Siberia not much beyond 60°. Its southern breeding-range extends to the Azores, Canaries, Madeira, the Alps, Carpathians, and Caucasus, to the Himalayas (where it breeds at an elevation of ten thousand feet), and to Mongolia and the mountains of Japan. It has not occurred in Iceland or Greenland, and only once on the Faroes; but accidental stragglers, no doubt driven westward by storms, principally from the Azores, have been met with on the American continent in Newfoundland, New Jersey, and Virginia.

† 2. *SCOLOPAX MINOR*.

The American Woodcock may be recognized at once by the extraordinary attenuation of its first three primaries, and by its unbarred primaries and underparts. The pattern of the colour of the upper parts is very similar to that of our bird, to which it is evidently very closely allied. Its range extends northwards to lat. 50°, and southwards into Texas, but its longitudinal range extends from the Atlantic only halfway across the continent. To the northern half of its range it is only a summer visitor; but in the southern half it is a resident, the numbers of which are largely increased during winter. There can be little doubt that it is the result of an ancient western emigration from the Old World.

3. *SCOLOPAX SATURATA*.

The Javan Woodcock is a resident in the island the name of which it bears, and where it breeds at an elevation of 7000 feet. It is evidently the result of a southern emigration of our bird, caused by the freezing-up of its breeding-grounds in the east by the snow of the Himalayas. The Javan Woodcock is smaller than our bird, but has a larger bill and a more rounded wing. The first primary is half an inch shorter than the second, and there are no bars on any of the primaries.

4. *SCOLOPAX ROCHUSSENI*.

The Moluccan Woodcock is confined to the small group of islands the name of which it bears, whither it probably emigrated from Japan. It is larger than our bird, and though its primaries are barred, it has no bars on the breast or under tail-coverts.

5. *SCOLOPAX ROSENBERGI*.

The Papuan Woodcock is a resident in New Guinea. It resembles the Javan Woodcock in being smaller than our bird, with a longer bill and unbarred primaries, but it resembles our bird as well as the Moluccan species in having the first and second primaries nearly equal in length.

These five species may fairly be regarded as forming a subgeneric group to which the name of Woodcocks may be applied. They seem to be more nearly related to each other than to any of the other species in the genus, though the next group presents so many points of similarity that the homogeneous character of the genus *Scolopax* is well preserved.

The Snipes which are most nearly allied to the Woodcocks are presumably the seven species which have the tibia feathered almost to the joint of the tarsus. They further resemble the Woodcocks in having the claw of the hind toe remarkably small, and the base of the bill remarkably deep, though neither of these characters are capable of very clear definition. It is necessary to coin a name for this group of seven species, and I propose to call them Semi-Woodcocks.

6. *SCOLOPAX NEMORICOLA*.

The Wood-Snipe appears to be entirely confined to India and Burma, breeding at high elevations in the Himalayas from Nepal to Assam, migrating in autumn to winter in hilly districts further south in those countries. The nearest allies of this species are, strange to say, *S. jamesoni* and *S. imperialis* from the American Andes. The three species have the whole of the underparts profusely barred, and the outer web of the first primary plain brown like the inner

web. The Asiatic species is distinguishable at a glance by the broad buff dorsal stripes, which are almost obsolete in its South-American allies, as well as by its smaller size (wing under $5\frac{3}{4}$ inches instead of over 6 inches).

7. *SCOLOPAX SOLITARIA*.

The Himalayan Solitary Snipe breeds at an elevation of from 10,000 to 15,000 feet, from Turkestan north-east as far as the Altai range, and south-east in the Himalayas as far as Assam, descending in autumn to winter in the lower valleys. Its nearest ally is scarcely more than subspecifically distinct from it, and probably interbreeds with it somewhere in South-east Siberia; but it has also a very close ally in *S. stricklandi*, which inhabits the forests of Patagonia. These three Semi-Woodcocks differ from the other three of which mention has been made in having traces of pale bars on the outer web of the first primary, and on both webs of some of the inner primaries and secondaries. They are further distinguished by the almost entire absence of bars on the centre of the belly. The Himalayan Solitary Snipe may be distinguished by its pure white lower breast.

8. *SCOLOPAX SOLITARIA JAPONICA*.

The Japanese Solitary Snipe breeds in Northern Japan, and probably in South-eastern Siberia as far east as Lake Baikal. It winters in China, though a few remain all the year round in Yezo. It has hitherto been generally confounded with the preceding species, the synonymy of the two forms being still more confused. The *Scolopax hiemalis* of Eversmann (Bull. Soc. Mosc. 1845, p. 257, pl. vi.), from the Altai Mountains, is unquestionably the Himalayan bird. The *Gallinago japonica* of Bonaparte (Compt. Rend. 1856, p. 715) is apparently a *nomen nudum* without description of any kind, and may belong to any of the half-dozen Snipes of Japan. It therefore must be allowed to drop altogether out of the synonymy, leaving the coast perfectly clear for the adoption of Swinhoe's *Gallinago japonica* (Ibis, 1873, p. 364), of which the type is now in my collection. The differences be-

tween the Himalayan and Japanese Solitary Snipes may be expressed as follows :—

Scolopax solitaria.

Scolopax japonica.

Lower breast white, with no bars.

Lower breast white, barred with brown.

Pale dorsal stripes very broad.

Pale dorsal stripes very narrow.

Primaries marbled towards the tip.

Primaries plain throughout.

Japanese examples appear to be constant, as are all the Turkestan examples that I have seen ; but in India slightly intermediate forms are found.

9. *SCOLOPAX STRICKLANDI*.

Strickland's Snipe is said to be a forest bird, inhabiting Chili and Patagonia. It resembles the two preceding species very closely, but may be distinguished in a moment by the fact that wherever they are white it is buff in colour.

10. *SCOLOPAX JAMESONI*.

Jameson's Snipe is a resident in the mountain plateaux of the northern Andes, where it breeds at an elevation of ten or twelve thousand feet, in Colombia, Ecuador, Peru, and Bolivia. In appearance it is somewhat intermediate between its two allies *S. nemoricola* and *S. imperialis*. It agrees with the former in the general colour of its plumage (which might almost be called grey when compared with the rich chestnut so characteristic of the latter), whilst it resembles its near neighbour in the size of its bill— $3\frac{1}{2}$ inches instead of $2\frac{3}{4}$ inches.

11. *SCOLOPAX IMPERIALIS*.

The Imperial Snipe is only known from a single Bogotá skin which looks like a rufous phase of the last-mentioned species, within the limits of the range of which it was found.

12. *SCOLOPAX AUCKLANDICA*.

The Auckland Snipe has occurred in New Zealand near the town of Auckland ; on the Chatham Islands, rather less than a thousand miles to the south-east ; and on Auckland Island, rather more than a thousand miles to the south-west. It is probably a mere coincidence that its island life has dwarfed it

exactly to the size of a Jack Snipe. In every other respect it is a Semi-Woodcock, and occupies an intermediate position between the two groups into which they are naturally divided. It agrees with one of them in having no traces of bars on the outer web of the first primary, and with the other in having the centre of the belly uniform in colour.

This concludes the group of Semi-Woodcocks, all the species of which differ from the true Woodcocks and agree with the Eastern Palearctic Snipes in having sixteen or more tail-feathers, some of the outer of which are considerably attenuated.

The typical Snipes are connected with the Woodcocks by two South-American species which possess characters apparently somewhat intermediate. In their large size, thick bills, barred primaries, and pale slightly spotted stone-coloured eggs they resemble the Woodcocks; but in the longitudinal marks of the head, in their tibiæ bare of feathers for some distance above the joint, and in their well-developed claw of the hind toe they are typical Snipes. Probably the resemblance to the Woodcocks is only accidental, that is to say, one of analogy rather than of affinity; though it is quite possible that it may be a case of reversion to the characters of a common ancestor. With the exception of the legs and feet, which resemble those of the typical Snipes, they look like giant forms of some species of Semi-Woodcock. The two forms only appear to differ in size, and are probably only subspecifically distinct.

13. *SCOLOPAX UNDULATA*.

The Cayenne Giant Snipe is only known from the mountains of Guiana, and is somewhat smaller than its next ally.

14. *SCOLOPAX UNDULATA GIGANTEA*.

The Brazilian Giant Snipe has been obtained near the course of the Paraná and near Buenos Ayres. Its reported occurrence in Peru and Cayenne may possibly be correct, but the evidence is scarcely conclusive. The two forms differ as follows :—

	<i>S. undulata.</i>	<i>S. gigantea.</i>
	in.	in.
Wing.....	6-6 $\frac{1}{2}$	6 $\frac{3}{4}$ -7
Bill	4-4 $\frac{1}{4}$	4 $\frac{1}{2}$ -5
Tarsus	1 $\frac{7}{8}$	2 $\frac{1}{4}$
Middle toe	2 $\frac{1}{2}$	2 $\frac{5}{8}$

Probably a large series of examples would show that the two forms completely intergrade. In both forms several of the outer feathers of the tail (which is supposed to consist of only fourteen feathers) are attenuated.

We must now take into consideration a very important group of typical Snipes, the *crème de la crème* of the genus—possibly the most highly developed, because showing the least trace of Woodcock blood and the closest relationship amongst themselves. Although there are ten of them, they vary so little that they must be regarded as having had a common origin at a comparatively recent date. But perhaps the most remarkable fact connected with them is their geographical distribution, which may throw considerable light upon the anomalies already pointed out in the distribution of the Semi-Woodcocks.

Ten species inhabit Africa south and east of the Great Desert; three breed in Eastern Siberia; and the remainder are natives of South America, principally the south and west of that continent. These facts can only point to one conclusion—that the original colony was in East Siberia, and that when the Glacial epoch drove them out of that region some emigrated east to the west coast of South America, whilst others wandered westwards to the east coast of Africa.

15. *SCOLOPAX STENURA*.

Of the three East-Siberian species the Pintail Snipe is the smallest (wing 4·9 to 5·3 inches), with the greatest number of tail-feathers (twenty-four), and with the outer half-dozen or so on each side the most attenuated (about ·1 inch in width). It breeds as far north as the Arctic Circle, from the valley of the Yenesay to the Pacific. It is doubtful whether it breeds as far south as the valley of the Amoor, but it winters in India, China, and the islands of the Malay Archipelago.

16. *SCOLOPAX MEGALA*.

Swinhoe's Snipe is a slightly larger bird (wing 5·4 to 5·6 inches), with rather fewer tail-feathers (twenty), and with the outer four or five on each side not quite so much attenuated (about ·2 inch in width). It breeds in South-eastern Siberia from Lake Baikal to the north island of Japan, and, passing through China on migration, winters in the islands of the west - Malay Archipelago.

17. *SCOLOPAX AUSTRALIS*.

Latham's Snipe is the largest of the three (wing 6·0 to 6·5 inches), with the fewest tail-feathers, and with only two attenuated tail-feathers on each side (about ·2 inch in width). It breeds in both islands of Japan, and passes the Philippine Islands and the coast of China on migration to winter in Australia and Tasmania. These three Snipes differ very slightly in colour; but, though they are very closely related to each other, there seems to be no reason to doubt that they are specifically distinct. Latham's Snipe is, however, still nearer to the Madagascar Snipe and the Noble Snipe of South America.

18. *SCOLOPAX NOBILIS*.

The Noble Snipe is only known from the plateaux of the Andes of Ecuador and Colombia. It differs principally from Latham's Snipe in having a shorter because more rounded wing (first primary only exceeding the fourth in length by $\frac{1}{4}$ instead of $\frac{3}{4}$ inch), and by having a longer bill (4 inches or more, instead of 3 inches or less).

19. *SCOLOPAX NOBILIS MACRODACTYLA* *.

It is not known that the Madagascar Snipe differs in any way from its Colombian ally except in having fourteen in-

* It is unusual to give the later name precedence over the earlier one, but in the present case common sense demands that the rule be violated. *S. macrodactyla nobilis* would imply a large variety of the Madagascar Snipe, which would be erroneous; *S. nobilis macrodactyla* means a variety of the Noble Snipe with a larger foot than usual, which is precisely the state of the case.

stead of sixteen tail-feathers*, and on an average a larger foot; but it is doubtful whether the latter character would hold good in a large series. As it is, the difference is so small that, in order to make it as perceptible as possible, it is necessary to measure the foot in the longest possible way, that is, from the joint of the tibia and tarsus to the end of the claw of the middle toe. These dimensions vary in *S. nobilis* from 3·0 to 3·3 inches, and in *S. macrodactyla* from 3·4 to 3·6 inches. So far as is known, the Madagascar Snipe is the only Snipe found on that island, and does not occur on the mainland.

The explanation of the apparently extraordinary fact that two such very closely allied birds inhabit such widely distant localities appears to me to be as follows:—Their nearest relative is unquestionably Latham's Snipe, which occupies a locality midway between them. The latter is a migratory bird, breeding in Japan and wintering in Australia; but there cannot be much doubt that it was once a resident in Japan, nor that a change in the habits of a bird from being a resident to being a migrant with a range of migration covering a distance of five thousand miles soon produced a corresponding change of structure. Its rounded wings and exceptionally long and heavy bill must seriously have impeded its progress, and we may confidently assume that Natural Selection soon lengthened the one to aid its powers of flight, and shortened the other so that it might have less weight to carry. What I wish to be inferred from this argument is the strong probability that Latham's Snipe—before it became a migratory bird—differed scarcely, if at all, from the present condition of its allies in Madagascar and Colombia. The cold of the Glacial epoch not only forced it to winter in Australia, but so reduced the area of its breeding-grounds that large bodies were compelled to emigrate in search of fresh breeding-places, as Pallas's Sand-Grouse did

* Even this character appears to be doubtful, as Messrs. S. Roch and E. Newton ('Ibis,' 1863, p. 172) state that the normal number of tail-feathers of the Madagascar Snipe appeared to be sixteen. I have never seen an example in which there were more than fourteen.

in 1863. It is difficult to say why Latham's Snipe did not stop in Australia and breed there; but there must be something either in the climate or food of that continent which does not suit the true Snipes during the breeding-season, as none of them are known to breed in Australia. Be that as it may, one party of emigrants seem to have flown almost due west to find a suitable home in Madagascar, whilst another must have flown almost due east to secure excellent quarters in Colombia. The birds which founded these two colonies, having discovered situations suitable for both summer and winter residence, probably neither changed their habits nor their structure. Their descendants are probably almost identical in form and colour with the common ancestors of the three forms when they were residents in Japan, and that is probably the explanation of their remarkable similarity at the present day. They have never passed through the ordeal of annual migration or been subjected to the sifting process involved in the non-survival of the least fit to endure the perils of such journeys. The alternative hypothesis that the Japan bird has retained its characters, and that the Madagascan and Colombian species have changed, is open to the objection that it seems impossible that two colonies so remotely situated could have independently varied in the same direction to a similar extent.

There is one very remarkable fact connected with this group of Snipes, and that is that the number of tail-feathers (which is very variable in this genus) appears to vary in distinct connection with geographical distribution, as if it were a climatic rather than a genetic variation. The Snipes inhabiting Europe and Africa have only fourteen tail-feathers (*S. gallinago*, *S. æquatorialis*, and *S. macrodactyla*); those inhabiting North and South America have sixteen tail-feathers (*S. wilsoni*, *S. paraguayæ*, *S. brasiliensis*, *S. magellanica*, *S. andina*, and *S. nobilis*), whilst the one inhabiting Asia (*S. australis*) has eighteen tail-feathers. The range of *S. gallinago* also extends to Asia, where it is said frequently to increase the number of its tail-feathers to sixteen. Of the other species of Snipe inhabiting East Siberia, two have twenty tail-

feathers, and one as many as twenty-four. This extraordinary development of additional tail-feathers in East Siberia is very remarkable, and is not confined to the Snipes. Two species of Ground-Thrushes, *Geocichla varia* from East Siberia and *G. horsfieldi* from Java (the latter obviously the result of a comparatively recent emigration from the former), are distinguished from all other Thrushes by having fourteen instead of twelve tail-feathers; and the Sea-Eagle of Kamtschatka also stands alone amongst his congeners as the possessor of fourteen tail-feathers. It is perhaps impossible to discover any rational explanation of these curious facts. Modern evolutionists have invented the hypothesis of Sexual Selection to explain those facts which appear to be incapable of explanation by the theory of Natural Selection. It seems impossible to imagine any benefit that could accrue to a species by increasing the number of its tail-feathers; and philosophers will probably explain this curious series of facts by attributing it to the influence of sexual selection, on the same grounds that many a man, not a philosopher, explains an action of which he is unable to give a rational defence, by saying that it was *a whim of his wife*!

20. *SCOLOPAX ÆQUATORIALIS* *.

By far the handsomest species of Snipe is that which inhabits Africa south and east of the Great Desert; and it is specially interesting because the geographical distribution of it and its allies presents a parallel case to that of the three species just mentioned. The Ethiopian Snipe is remarkable for the clear definition of its markings and the velvety gloss of the black on its upper parts. Evidently it is very nearly

* This species is often called *Scolopax nigripennis*, a name given by Bonaparte to a Snipe said to have come from the Cape. He describes the outer web of the first primary as black, whence the name *nigripennis*. As, however, the Ethiopian Snipe happens to be distinguished from the other species which breeds in the Ethiopian Region, and from the species which only winters there, by the fact that the outer webs of its first primaries are *white*, there can be little doubt that the name is a slip of the pen for *albipennis*; but the adoption of either name is, of course, out of the question.

allied to the Common Snipe, with which it agrees in having the outer web of the first primary white, and in having the axillaries varying in colour from unspotted white to white regularly and broadly banded with brown; in size, also, it scarcely differs, but it may always be distinguished by the whiteness of its under tail-coverts and outer tail-feathers, and by the narrowness of the outer tail-feather on each side, though the number of tail-feathers is the same (fourteen). The relationship is close; but there cannot be much doubt that the Ethiopian Snipe is specifically distinct from its Palearctic ally, though the winter range of the latter is said to join the breeding-grounds of the former in Abyssinia. It is worthy of note that the European Snipe is a migratory bird, and has consequently more pointed wings than those of its Ethiopian ally, which is a resident. The Ethiopian Snipe inhabits the east of Africa from Abyssinia to the Cape, and is doubtfully recorded from Benguela and Senegambia on the west.

21. *SCOLOPAX FRENATA PARAGUAYÆ*.

Closely related as are the Common and Ethiopian Snipes, the latter has a still closer relationship to the Chilian Snipe, which is apparently an intermediate form having some of the characters of each. The wings are more rounded than in the one and not so much so as in the other. The shape of the tail-feathers (the outer on each side attenuated) resembles that of the Ethiopian Snipe; but the colour of the under tail-coverts and outer tail-feathers is the same as in the Common Snipe.

The only conclusion that appears probable seems to be that the ancestors of the three forms were once residents round the basin of the North Pole, and that they varied but little from the present East-African and west South-American species. After the Glacial epoch drove them south they became residents in two colonies, one in the eastern hemisphere and one in the western, in both of which they found in the south conditions of life so similar to their former existence that they have scarcely changed, though they have been so long isolated. Both in the Old and in the New

World it appears that many individuals never crossed the line, but, adopting migratory habits, followed the retreating cold almost to their old quarters, and in consequence of their more changed conditions of life have themselves undergone a somewhat greater change, and are now the Common and American Snipe respectively.

The South-American form of the Common Snipe has an extended range, and varies to some extent in consequence. The Chilian Snipe appears to be confined to the highlands of Bolivia, Chili, the Argentine Republic, and Paraguay. In the latter country it meets with a very close ally—

22. *SCOLOPAX FRENATA BRASILIENSIS*.

The Brazilian Snipe is merely a small form of the preceding (wing $4\frac{1}{2}$ to 5 inches, instead of 5 to 6 inches). Its range extends from Paraguay, through Brazil, to Guiana and Venezuela.

23. *SCOLOPAX FRENATA MAGELLANICA*.

The Falkland-Island Snipe is merely a pale form of the Chilian Snipe, breeding on the Falkland Islands and near the Straits of Magellan, migrating northwards in autumn along the east coast of South America as far north as Rio de Janeiro. These three Snipes do not differ in length of bill, which varies from 2·4 to 2·8 inches.

24. *SCOLOPAX FRENATA ANDINA*.

In the Peruvian Andes a Snipe occurs which we may call the Peruvian Snipe, combining the small dimensions of the Brazilian Snipe with a bill of only 2 inches in length.

The last half-dozen species or subspecies of Snipe can scarcely be regarded as more than tropical forms of the Common Snipe. They vary very slightly in colour or pattern of colour, the variation between the species being scarcely greater than those within each species. It is a very remarkable fact that in a genus like *Scolopax*, containing twenty or thirty species distributed almost over the whole world, the variation in colour should be so small; and the fact is all the more remarkable when we discover that within the limits of

each species the range of variation is so large that the construction of hard-and-fast diagnoses is very difficult. The Semi-Woodcocks naturally divide themselves into two groups: half the species having the inner and outer webs of the first primary uniform in colour, whilst in the other half the outer web is white or barred with white. The same character appears to be also an important one in the typical Snipes; and, so far as those which inhabit Europe, Asia, Africa, and North America are concerned, it appears to be a fairly constant one; but in South America it breaks down altogether. In the four subspecific forms or local races of *Scolopax frenata* the outer web is sometimes white, sometimes brown, occasionally white on the basal half and brown on the terminal half, and examples occur in which it is white on one wing and brown on the other. The number of tail-feathers is also so variable in many, perhaps in most, of the species that its practical value as a diagnostic character is very small indeed. The extent to which the outer tail-feathers are barred does not vary quite so much as the colour of the axillaries in some species; but the shape of the outer tail-feathers appears to be slightly more reliable. There can be little doubt that the diagnosis of *one or more tail-feathers on each side stiffened and attenuated*, though somewhat vague, would exclude the five Woodcocks and the four typical Snipes yet to be considered, whilst it would include the seven Semi-Woodcocks and the twelve typical Snipes already considered. The importance of the outer tail-feathers as a specific character in this genus becomes obvious when the somewhat startling fact is realized that, if the outer four or five feathers on each side of the tail were cut away in examples of *S. gallinago*, *S. wilsoni*, and *S. paraguayæ*, it would be impossible to guess to which of the three species any one of them belonged.

It may appear an arbitrary and clumsy arrangement; but it is necessary to draw some definite line which will diagnose the four typical Snipes yet to be considered from the twelve preceding species. The two monster Snipes of South America may be dismissed on account of their barred primaries,

but the other ten species can only be satisfactorily determined by the width of their outside tail-feathers, which measure .2 inch or less, whilst those of the four species now to be considered measure .3 inch or more.

These four species only breed in the Nearctic and Palæarctic Regions, or the Northern Zone; and, with the curious exception of East Siberia, no part of the Northern Zone is inhabited by any other species of Snipe.

25. *SCOLOPAX GALLINAGO*.

The Common Snipe breeds throughout the whole of North Europe and Siberia, but it is very rare north of lat. 70°, and in the southern portion of its breeding-range it is chiefly confined to mountain-chains. Its range extends west to Iceland and the Faroes, and possibly to South Greenland, and it is said that in both the former localities a few remain to winter. It has been said to breed in Algeria, and is known to do so on the southern slopes of the Alps and in South Russia. Both Severtzow and Scully found it breeding in Turkestan; and Przevalsky says that a few remain to breed in South-east Mongolia. It is a winter visitor to the basin of the Mediterranean and to North Africa, as far south in the west as the Azores, Madeira, the Canaries, and the valley of the Gambia, and in the east as far as the southern shores of the Gulf of Aden. In Asia it winters in Persia, India, Ceylon, the Andaman Islands, and Burma. It has once occurred on the Malay Peninsula, but it passes regularly along the coasts of Japan on migration to winter in China, Formosa, and the Philippine Islands.

+ 26. *SCOLOPAX GALLINAGO WILSONI*.

A comparison of a large series of skins of the North-American Snipe with a still larger series of examples of the Common Snipe presents some curious anomalies. The extreme forms of the two species may be diagnosed as follows:—

Scolopax gallinago.

Tail-feathers *fourteen* in number.
 Axillaries *white*.

Breast with obscure dark *longitudinal streaks*.

Bill varying from 2·8 to 2·5 inches in length.

Outer tail-feather crossed by *three* dark bars.

Scolopax wilsoni.

Tail-feathers *sixteen* in number.

Axillaries *transversely barred with broad dark bands*.

Breast with obscure dark *transverse bars*.

Bill varying from 2·7 to 2·3 inches in length.

Outer tail-feather crossed by *five* dark bars.

So far as I know, the American birds are always constant to their characters; but, unfortunately for the validity of the two species, there is not one of these characters (except perhaps the very short bill, which is not always characteristic of the American form) which does not frequently occur in examples from the Old World. Hume says that in India Fan-tailed Snipes with sixteen tail-feathers are common enough. Snipes with barred axillaries are perhaps the rule rather than the exception, even in England. Snipes with transversely-barred breasts are occasionally found in the Old World, and the number of bars across the outer tail-feathers of British-killed examples varies from three to five. Nevertheless, I have never seen an Old-World example of a Snipe possessing all the characters of the American species.

It is easy to suggest a reason why the Nearctic Common Snipes should vary less than the Palæarctic Common Snipes. During the Interglacial period preceding the Glacial period (probably the last of the series), which more or less differentiated these two forms, they were presumably a circumpolar species. The gradual accumulation of ice at the North Pole gradually drove the species south, and soon isolated the Nearctic from the Palæarctic birds. Isolation was followed by its usual concomitant—differentiation, and the impossibility of interbreeding caused the two groups to become at least subspecifically distinct. The conformation of the American continent did not prevent constant intercourse in their temporary quarters in the south; consequently, whatever changes took place in the species became common property. On the other hand, in the Old World, the Snipes

were probably isolated, during a severe Glacial period, in at least three separate colonies—in West Africa, the valley of the Nile, and the plains of India. As there is reason to believe was the case with the Willow-Wren and its close allies the two Chiffchaffs, the central colony appears to have been the most altered—Snipes with pure white axillaries being most common in Eastern Russia and Turkestan. The Willow-Wrens seem, however, to have been a more plastic race than the Snipes, and their differentiation appears to have been complete; although the present range of the Willow-Wren overlaps that both of the Eastern and Western Chiffchaff, the result is that, if cross-breeding takes place at all, it only produces a barren hybrid, and the species remain distinct. We may fairly assume that, in the case of the Snipes, differentiation was not carried far enough, and that consequently the Palæarctic Region is peopled with a race of mongrels.

The North-American Snipe is a summer visitor to the whole of the continent from the Atlantic to the Pacific up to the Arctic Circle and down to the latitude of New York. It winters in Mexico, Central America, the West Indies, and the extreme northern portion of South America. A few breed as far south as Maryland, and a few pass the winter as far north as Texas.

27. SCOLOPAX MAJOR.

The geographical distribution of the Great Snipe is specially interesting as affording one of many other examples of migratory birds which have extended their breeding-range to a considerable distance, but, in consequence of their having continued to follow their ancient "fly-lines," have caused the line of migration to and from their more recently annexed breeding-grounds to be remarkably circuitous. The range of the Great Snipe extends in summer from Scandinavia to the valley of the Yenesay, but in winter is confined to the basin of the Mediterranean and the continent of Africa. The Great Snipe is not even known to pass through Turkestan on migration, but apparently crosses valley after valley in Asia until it turns southwards in the company of the European members of the species. It breeds in suitable localities throughout the basin

of the Baltic, and in Scandinavia as far north as lat. 70° . In the valleys of the Petchora and the Obi it ranges up to lat. $67\frac{1}{2}^{\circ}$, but in the valley of the Yenesay it has not been met with further north than lat. $66\frac{1}{2}^{\circ}$. It passes through North Persia and the Caucasus on migration, and winters in suitable localities throughout South Africa, though a few remain in the basin of the Mediterranean.

As its name implies, it is rather larger than the Common Snipe, which it resembles very closely in the colour and marking of its upper parts, though the white tips of its wing-coverts are more conspicuous. Its under parts are more profusely barred, but the chief distinction lies in the tail, which consists of sixteen feathers. In the adult Great Snipe the terminal half of the four outside tail-feathers on each side is unspotted white, whilst in the Common Snipe it is buff with a subterminal dark brown bar.

28. *SCOLOPAX GALLINULA*.

The Jack Snipe is a much smaller bird, scarcely half the weight of the Common Snipe, and easily distinguished by the purple gloss of its mantle and the green inside web of its scapulars. It breeds locally in the Arctic Regions as far north as lat. 70° , from the Atlantic to the Pacific, and on the Dovrefjeld above the limits of forest-growth. It passes through Turkestan and Japan on migration, and winters in the basin of the Mediterranean, in Persia, Afghanistan, India, Ceylon, Burma, and Formosa.

The geographical distribution of the Snipes is almost an exact parallel to that of the Thrushes, a group of birds quite as cosmopolitan. The Common Snipe and the Song-Thrush and their respective allies inhabit the Nearctic and Palæarctic Regions. The Snipes of the Ethiopian Region and the *Planesticæ* (*Turdus olivaceus* and its allies) of the same Region find the closest possible allies in the Neotropical Region. The Himalayan Semi-Woodcocks and Ouzels (*Melospiza*) are represented by very near allies in tropical America, though the former have not left traces of their emigration in the Pacific Islands as the latter have done. The coincidence can scarcely be regarded as accidental, but appears to be an instance of the same causes producing the same effects.

In conclusion, one question suggests itself as a necessary corollary to these curious facts of the geographical distribution of the Snipes. What connection can be traced between them and the Zoological Regions into which the world has been divided by Sclater and Wallace? The only reply that can be honestly given is:—*none at all!* The fact is that the so-called Zoological Regions are not zoological. They are fairly accurate as regards the distribution of the Mammals; somewhat more so in relation to Passerine Birds, and somewhat less so in relation to true Reptiles. For Fishes and Batrachians we are told that an entirely different set of Regions have had to be invented, and these appear to be much more applicable to Non-passerine Birds than those usually adopted.

The geographical distribution of *Scolopax* appears to be somewhat anomalous from either point of view. The Painted Snipes are confined to the Equatorial Southern Zone, and are found in each of its four Regions—the Indian, the African, the Tropical American, and the Australian Regions. The Woodcocks are also found in the Northern Zone, but those inhabiting the Europeo-Asiatic Region and the eastern half of the North-American Region appear to form one group, whilst the other is found only in the south-east of the Indian and the north-west of the Australian Regions. The range of the Semi-Woodcocks being confined to the Himalayas and the Andes, with outlying species in Japan, and in Auckland Island, south of New Zealand, would be most complicated if expressed in terms of either system of Regions. The typical Snipes are only absent during the breeding-season from the Oriental and Australian Regions; but it is worthy of note that the only species found in the Nearctic Region finds its nearest ally in the Palæarctic Region, whilst some of the Snipes of the Ethiopian Region are doubtfully distinct from some of those of the Neotropical Region. The final conclusion to be arrived at appears to be that the Snipes recognize to a considerable extent the Regions of Günther and Boulenger, but are lamentably ignorant of those propounded by Sclater and Wallace.